Former Soviet Union's environmental and health problems

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Let me begin by making some slightly long introductory comments that will provide the context for the specifics of the "case study" at hand. Most basically, I use a broad definition of "environmental security' when asking, "Does it matter to the United States or to our allies?" The evolution of U.S. policy in this area thus does not surprise me. The spread of concerns about environmental security has led not only to new statements of purpose and activities by the Department of State, the Department of Defense, the United States Agency for International Development and others. (See, for example, the new 1996 U.S. National Security Strategy document issued by the White House in January of 1996, relevant portions of which are reprinted in the Appendix.) It has also resulted in the formation of an Environmental Security Workshop at the Woodrow Wilson International Center for Scholars of the Smithsonian Institution in Washington D.C., under the directorship of P.J. Simmons, and to new publications, such as a new journal called (not surprisingly) *Environment & Security*. In the unofficial "propaganda" for the journal aimed toward new subscribers, the editors cite "The ending of the Cold War era [which] has provided the occasion for a reassessment of the meaning of security in the national and international contexts. . ." In particular, they stress the potential consequences of environmental impacts such as ozone depletion, climate change, deforestation, desertification, the decline of ocean fisheries, and loss of biodiversity in the context of continuing population growth. If these were not enough of an agenda for the journal, they add "These changes give rise to new security concerns for they pose a direct threat to the welfare of human societies and can contribute to conflicts and violence within and among states."

Turning to the specifics, it is to me not surprising given the past Cold War relationship between the former Soviet Union (FSU) and the United States that this region has been a focus of attention as the environmental security concept evolves. Consider, for example, Secretary of State Warren Christopher's speech, at Stanford University on April 9, 1996, with the formal title of "American Diplomacy & the Global Environmental Challenges of the 21st century," reprinted in the Appendix. The secretary made clear, after first addressing global issues, that in the regional context: "There can be no doubt that building stable market democracies in the former Soviet Union and Central Europe will reinforce our own security. However, for these new nations to succeed, we must help them overcome the poisonous factories, soot-filled skies and ruined rivers that are one of the bitter legacies of communism. The experience of this region demonstrates that governments that abuse their citizens too often have a similar contempt for the environment."

Continuing, Secretary Christopher commented that "Russia and China are both confronting major environmental problems that will have *a profound effect on their future—and on ours."* (emphasis added)

A similar concern with this critical region appears in the Memorandum of Understanding (MOU) among the Environmental Protection Agency, the Department of Energy, and the Department of State. Concerning Cooperation in Environmental Security, reprinted in the Appendix. This MOU was designed "to enhance environmental cooperation between the United States and foreign partners, including the Baltic States, Russia, Eastern Europe, other states of the FSU, and Asia–Pacific nations through information exchange, research and development, technology demonstration and transfer, regulatory reform, emergency response training, and environmental management."

Nor is this interest in the FSU limited to the United States. The environmental minister of the European Union, Mrs. Ritt Bjerregaard of Denmark, in September of 1996, stipulated that Central European countries will not be admitted to the European Union until they take on their environmental problems more vigorously. They must bring many laws, standards, and rules into line with those of Western Europe, incorporating into national law over 200 European environmental-related directives (Simons 1996). It may be a long time before they become full members—but at least the line has been drawn as to what is necessary, and even more so, hopefully attended to as required.

With this as background, let us now turn to the specifics of the discussion at hand. There are a myriad of problems affecting the FSU, and potentially its neighbors and the United States. While I will discuss each separately, the reader should remember that all of these occur together, and are all linked. In fact, it is their synergistic impact that is so devastating, and makes the FSU such a daunting case study.

Air pollution. In terms of air pollution, the emission of solid particulates, sulfur dioxide, and nitrogen oxide pose the greatest region-wide environmental security problems (i.e., for all of Central Europe and the FSU). Discharges, especially of sulfur dioxide, from Central European sources are the highest in Europe. We have a prime example from the Norwegian experience. The Norwegian Greens proposed literally "bombing" plants in the Nikel' region due to dangerous potential hazards from transborder windblown effects, which it was feared could cause in Norway low life expectancy similar to those of workers (34 in Nikel') and of residents of the city (44 years of average life expectancy at birth) at the height of production. Atmospheric pollution from the nonferrous metallurgical kombinats "Severonickel" and "Pechenganickel" on Kola Peninsula also has serious implications for northern Europe, Finland as well as Norway (WHO 1996, p. 2-4). Particulate emissions in l991 reached 15.4 thousand tons from the Severonickel plant and 6.0 thousand tons from Pechenganickel. Sulfur dioxide emissions for this same year were measured at 257.5 thousand tons from Severonickel and 195.7 thousand tons from Pechenganickel (Yablokov, p. 25).

Acid rain is thus a major issue in this region. While the overall average in Russia and Ukraine is no higher than in West Germany and Sweden,[1] there are many locations where emissions from specific plants and facilities is so great that the forests in the given regions are totally dead. Forests within a 20-kilometer radius of Monchegorsk, site of the Severonickel' Combine, are reported to be completely dead. Norilsk Nickel Combine in Siberia on the Taymyr Peninsula is the source of destruction of over 2.5 million hectares (over 5 million acres) of the surrounding tundra and forest-tundra land. Countries affected by acid rain originating in Russia include not only Norway, but also

Kazakstan, Finland, Ukraine, Belarus, and Sweden (Audritsh 1993, p. 13).

It is not only acid rain that affects flora. The fall-out of heptyl in the Plesetsk testing range area has killed vast areas of fauna as well as flora. I understand that an American process is being used to detoxify the stocks of this liquid rocket fuel—but given the size of the stock, it may take quite a while. Again this largely affects Russia, but when the Baltic states took control of their countries there were several incidents where the local governments refused—because of the danger of this supertoxic, nerve-paralyzing, carcinogenic, and volatile material—to move into military sites where heptyl had not been withdrawn by the Russian military .

Water pollution. When one is concerned about societal stability and the underlying health of a population, water quality is of major importance. As a vector of disease, poor water quality is responsible for many illnesses. With 75% of all surface water in Russia, as well as Ukraine and other areas still polluted (as it has been for many years now), and perhaps getting worse in quality, then this could well contribute to the evaluation of UNICEF several years ago that Russia faces the potential for "social disintegration." Among many examples of the pollution of the waters, one major incident occurred when a polymer plant in Belarus accidentally discharged tons of an organic cyanide compound into the Daugava River in 1990, leading to a massive fish kill in Latvia. The Dniester River was further contaminated through excessive pesticide use in Ukraine and Moldova (Yablokov, p. 17). Other pollutants, including heavy metals such as lead, cadmium, mercury, and vanadium are at much higher levels than in the EEC.

Another example occurred near Arkhangel'sk, where the population has become endangered when a plant decided to clean its pipes and discharged 16 tons, not kilograms, of mercury into the Northern Dvina River. This travesty hardly received any attention, certainly in comparison to the Usinsk oil spill, but it is only one of some 700 such accidents every year. These not only affect local regions in the FSU, but also are a danger to the United States and/or its allies through their penetration into the Arctic Ocean through the rivers emptying into this ocean. More than 53% of the organic wastes in the Baltic Sea comes from Poland, former East Germany, and the FSU (Audritsh 1993, p. 15).

Environmental pollution by DDT and related compounds such as polychlorinated biphenyls, dioxins, and polyaromatic hydrocarbons, seem to be mostly a local, albeit very serious problem. (DDT, by the way, was produced in the FSU until at least 1989.) It probably does not pose an immediate ecological threat to Europe (Audritsh 1993, p. 15) or nearby Asian countries, but it should be noted that such persistent chlorinated compounds are found throughout the Arctic.

The contribution of polluted water to disease is also a concern. Such water was a significant contributor to the spread of cholera recently at quite a high level in Ukraine, less so in Russia, but potentially high again unless internal bodies of water are cleaned up. Such outbreaks have international dimensions; cholera outbreaks have spread from Russia and Ukraine to other eastern European countries, and, according to the World Health Organization, to Finland, Poland, and Turkey (Galazka, Robertson, and Oblapenko 1995). The prognosis for an improvement in the cholera situation remain unfavorable due to the activization of epidemic processes and the constant risk of the infection being imported to any country of the world (Onishchenko et al 1994, pp. 34-

39). Recently, the border from Mongolia to Russia was closed due to an outbreak of cholera in Mongolia.

The seas. The relationship between oceans and the environment has long been recognized. For example, the United Nations Convention on the Law of the Sea provides for the rights of coastal states to control activities in adjacent, offshore areas to protect their economic, security, and environmental interests. Consider in this regard the Arctic Ocean. The Arctic region is a virtual laboratory that can give "early warning" of environmental damage. Thus, the newly established European Environment Agency is paying particular attention to this because of the concern of its member states, and wariness that the currents in the ocean will bring additional pollution dangers from previous Russian dumping to its member states (Yablokov, p. 22).

U.S. concern is mostly manifested in the issues related to nuclear submarine dismantlement and to the dumping of nuclear submarines with nuclear reactors and fuel rods still intact, as well as undersea nuclear waste dumping sites that might affect the Norwegian, Barents and Kara Seas (Europe's Environment 1996). Very recently, in fact, international reaction and fear has been sufficient to lead to an agreement by the United States and Norway to provide technical and financial aid to help Russia dispose of nuclear submarine reactors and other radioactive waste. The Norwegians have a compelling reason to fear nuclear accidents on land and in the sea, as well as potential destruction of their fishing zones (Audritsh 1993, p. 16).

This latter point, as well as concern for the health of Alaskan citizens impelled Senator Stevens of Alaska to have the late, lamented Office of Technology Assessment prepare a major report on the potential danger to Alaska. While that report found no clear and present danger, it did not exclude future problems. However, the research of Dr. Ted de Laca at the University of Alaska, Fairbanks, indicates that major sources of potential danger were not incorporated in the estimates for radioactivity emanating from Russian sources in the form of major river estuaries containing radioactivity from internal sites transiting through the rivers to the Laptev Sea in particular—whose currents are more directly transporting contaminants toward Alaska and other Pacific Rim countries. In addition, the work of Dr. Dan Jaffe, another faculty member who is building wind direction models, shows that possible nuclear power station accidents at, for example, Bilibino would impact Alaska in four days (based on a number of models and assumptions). It thus behooves the United States and other interested governments to expand their activities in the realm of nuclear safety and remediation of existing contamination in the Arctic region as well as elsewhere.

There are also problems regarding the Baltic Sea. For one thing, it contains increasing concentrations of mercury, cadmium, lead, nitrogen compounds, petroleum products, detergents, and organic wastes as a result of dumping activities (NY Times 1996, A12). Equally important environmentally are the dangers emanating in and from this sea as a result of the large amount of chemical weapons which were dumped in the post–World War II period. Between 100,000 and 300,000 tons of poisonous compounds, mainly sarin and mustard gas, were disposed of at a depth of a few dozen meters (NY Times 1996, pp. 16-17). Undoubtedly even more of a danger to the ten littoral countries of the Baltic Sea is the earthen dam containing nuclear wastes at a site in Sillamae, Estonia. This dam is separated from the Gulf of Finland leading to the Baltic Sea only by

10 meters. The United States and/or its allies should at the minimum spray concrete on the dam perimeter. In mid-September of this year, the Estonian government finally allocated in local currency, 4.8 million kroons ($400,000) to seal the banks of the lake, but this amount is far short of the one billion kroons ($83 million) estimated by Mr. Bjerregaard to be the necessary level of expenditure (Boreyko 1994, p. 3). Perhaps the fact that the Helcom Commission's research found that there is no clear and present danger here as well reduces the concern of the U.S. government, but not mine.

The Black Sea has been polluted by eastern Europe. For example, pollution from the Danube alone contributed 60,000 tons of phosphorus, 340,000 tons of nitrogen, 1000 tons of chromium, 900 tons of copper, 60 tons of mercury, 4500 tons of lead, and 50,000 tons of oil each year annually (EcoNews 1996, p. 18). Additionally, a number of rivers from Ukraine and Russia contributed substantial but unmeasured mercury, cadmium, lead, nitrogen compounds, petroleum products, detergents, and organic wastes (Pomfret 1994). There even are reports of nuclear waste being dumped by the Soviets into this sea as well as the Arctic seas. Adding to the problem is the fact that there were ten major oil spills in the mid-1980s alone affecting this sea (Pomfret 1994, p. 17).

Hydrogen sulfide is another potentially serious problem in the Black Sea, not only for the former Soviet Union, but also for other countries such as Bulgaria and Turkey. Its toxicity is such that a five minute exposure to 800 parts per million (ppm) has resulted in death; inhalation of 1000-2000 ppm may cause coma after a single breath. It is flammable in the air, and its combustion products (sulfur oxides) are also toxic by inhalation (Boreyko 1994). Thus its presence in the Black Sea is a genuine concern, but not sufficiently recognized in my opinion by various domestic and international governmental agencies so far. This is not to say that nothing has been done, but that so far most of the activity is scientific tourism. The water is heavily saturated with hydrogen sulfide 100 meters below surface (the level where oxygen runs out [The oxygen-less zone is now more than 15,000 square miles, about one-tenth of the total area] (HHMI 1996). Since the late 1970s, the boundary of water poisoned by hydrogen sulfide has risen from depth of 200 meters to 50-85 meters, (AFP 1992) rising to the surface at a rate of 2 meters per year (according to joint American-Turkish survey in 1988) (Vinogradov 1988, p. 42). If the gas reaches the surface, an explosion might be triggered that could destroy all living creatures in the sea and kill hundreds of thousands of inhabitants of the former Soviet region, Turkey, and the former east European countries bordering the sea (Vinogradov 1988, p. 46). Yablokov, the former environmental advisor to President Yeltsin, has warned that it could bring unprecedented scale of injection of hydrogen sulfide to significant territories of Turkey, Rumania, Bulgaria, Ukraine, Russia, and Georgia (Vinogradov 1988). As in other cases, there is some but not much talk; even less is being done to reduce this danger to themselves and other countries.

As in the case of the Baltic Sea, in addition to these pollutants, ammunition was systematically dumped by Soviet military authorities into the Black Sea without permission from Ukraine's environmental agencies. Reportedly, for example, poisonous chemical weapon compounds (mainly mustard gas) were dumped at a depth of only 50 meters (Yablokov, p. 24).

The Sea of Japan offers additional examples. Mustard gas was dumped at a depth of 1 km not far from Vladivostok in 1941;[2] expired ammunition was dumped in the Aniv gulf near Sakhalin Island, in July of 1995 (Boreyko 1994, p. 16). As in other

areas, nuclear dumping occurred here; more than 144,000 cubic meters of nuclear waste was dumped in the East Sea near Kamchatka between 1966 and 1992 (Belovitskiy 1995, 55). More prosaic wastes are also a problem: only 3% of Vladivostok discharges are currently processed in the city's underdeveloped purification system (YONHAP 1993). Whether these pollution events will affect Japan is not known; but it should be noted that it is unlikely given the hydrolyzing effect of water movements in the sea area.

The Aral Sea is technically a lake (or rather lakes); formerly it was the fourth largest lake in the world. It is much smaller now; the shrinking of the Aral sea has been caused by irresponsible water diversion irrigation schemes. To make the situation worse, the canals diverting water from the Amu-Dary and Syr Darya are not lined; consequently, there are losses due to water seeping into the desert (and creating underground aquifers), in addition to the water lost to evaporation: only 30% of the water diverted away from the Aral Sea reaches its destination, an issue denied by central Asian authorities.

This substantial alteration of a major body of water has already had numerous effects. Changes have occurred in weather patterns due to the drying up of the water body and to salt storms. Desertification has accelerated alarmingly (2 million hectares in a former aquatic area). Climate changes include hotter, drier summers and longer, colder, more snowy winters.

These changes will not just be local. Records show that the disappearance of the Aral Sea will inevitably have an effect, and possibly already has had one, on the climate of not only all of central Asia, but, according to Yablokov, southeastern Europe, India, and even China as well (Popov 1995). The growing season in the impacted regions, according to some reports, already has been shortened by two months (Yablokov, 23).

The salinity of the sea increased from 10-30 grams per liter over the 30-year period 1960–1989, and since then to 100 grams per liter. This, combined with the heavy fertilization in the attempt to restore fertility of the soils in riparian areas, leads to large quantities of residual minerals salts in the water and adjacent soils. Thus, some of the 10–12 salt storms every year are large enough to be witnessed from space by Soviet cosmonauts (Thomas 1993, p. 22), with a sharp rise in intensity and frequency of regional windstorms (Thomas 1993, p. 13). It is variously estimated that these storms carry 75 or up to 150 million tons of dust, pesticide residues and mineral salts annually, leading to desertification (Thomas 1993, p. 22), as well as sickness when it affects crops and people. The deputy head of Uzbekistan's Academy of Sciences predicted in 1989 that the changing climate could have detrimental effects on the food supply even of India (Thomas 1993, p. 23). The resulting desert, called the Ak-kum Desert, is now expected to reach 3 million hectares (about 7 million acres) in size by the year 2000 from nonexistence some three and one-half decades ago (Myrzayev 1992, p. 300).

I am particularly worried about the little discussed possible consequences of development of a land bridge to Voskreseniye Island resulting from this desiccation. When it is no longer an island in the middle of a sea, the probable residues of biological weapon activities that occurred in the past could slip through containment and may well lead to illness or deaths.

Ozone depletion. The FSU both suffers from, and contributes substantially to, depletion of the stratospheric ozone layers as a result of the emission of chlorofluorocar-

bons (CFCs) from, among other places, the United States as well as Russia. Reports from Russia indicate that the ozone layer itself over central Siberia was reduced by some 40% in 1995. Nonetheless, the manufacture of CFCs continues in the country with production levels of around 100 thousand tons of ozone-damaging coolants several years ago reported by Yablokov (Turkmen Press 1996). More ominously, as noted by President Yeltsin, most of the international smuggling of fluorocarbons originates in Russia.

Global climate changes. Forest changes in the FSU, particularly Siberia, contribute to global climate change forcing. Some 2 million hectares a year are felled and replaced each year officially; in reality, only 60–70% are replaced and that number is undoubtedly even less so under current economic conditions. According to one source, if the present rate of loss continues, the forests will disappear completely within the next 30 years

Most importantly, the loss of the carbon sink from such high losses of forest cover may be more significant than the loss of the Amazon forests. If we calculate that the boreal, small leafed forests of Siberia absorb some 75% of the amount absorbed by the large-leafed forests of the Amazon region, and that the latter loses some 5 million hectares per year, and the level of losses in Siberia is some 10–12 million, a simple calculation yields a loss of 7.5–9 million "equivalent" hectares, distinctly more than the 5 million of the Amazon (Yablokov, p. 19).

Biodiversity. The loss of forests not only reduces an important carbon sink, but has potentially significant negative impacts on global biodiversity. The vast relatively intact ecosystems of Russia "offer one of the last opportunities on earth to conserve landscapes large enough to allow ecological processes and wildlife populations to fluctuate naturally ." (Yablokov 1994) Efforts are being made to quantify the biodiversity of the FSU: an international project leading to a multivolume "Flora of North–East Eurasia" is under way, for example. (Radio Liberty 1994) Hopefully this will inform and support efforts to protect biodiversity, as well as activities to prevent the destruction of rare plants that might lead to important medical discoveries as well.

Nuclear issues. Among the very important issues for the United States is the question of the management of nuclear materials in the FSU. This is not just a technical, but an organizational problem. Thus, the Russian equivalent of our Nuclear Regulatory Commission, the Gosatomnadzor, is currently battling with the Ministry of Atomic Industry over whether Gosatomnadzor has the right to inspect and order corrections in the operations of the civilian and military sites operated by MinAtom. Most critical, of course, is the issue of the nuclear safety of these sites—not only from explosions, but also the potential for terrorist actions and thefts, and their potential use by individuals, organizations and/or governments against us or our allies. As with all nuclear issues, the rivalry between secrecy versus glasnost is strong: for example, the number of "secret cities" where nuclear activities took place is not yet clear. There are troubling signs, such as the arrest of the retired naval captain working for the Bellona Foundation of Norway who reported on radioactive contamination and dangers in the Northern Fleet operations. More broadly, the State Secrets Act has been rewritten to enhance secrecy: it now covers all ministries and agencies, civilian as well as military, and revokes those parts of

the previous act that excluded environmental and health information from such secrecy.

Ocean dumping of nuclear waste in contravention of the London Convention is part of the pattern of careless management of nuclear waste. For many years the dumping of liquid and solid nuclear waste in the northern seas was accomplished by dumping in relatively shallow waters, far above the minimum depth agreed to by Soviet authorities in the London Convention. Temporarily suspended, at least until land-based repositories are even fuller or over-full, this pattern of dumping raises much concern in Scandinavia, and the flouting of international agreements in nuclear waste management must be of concern to everyone.

In addition, Kola Peninsula, on which major nonferrous metallurgical processing plants are located, contains more nuclear facilities, military research and civilian, than any other place in the world. This is the subject of much concern to western governments—including finally the United States. In September 1996. the U.S., Norwegian and Russian governments signed an agreement to clean up Kola's environment, especially that of the nuclear submarines that have been decommissioned. But decommissioning does not mean proper treatment of environmental hazards unless additional specific abatement procedures are implemented. Andreyev Bay, only several kilometers from the Norwegian–Russian border, has a large number of decommissioned nuclear submarines with nuclear fuel on board. Other submarines have had their reactors removed but stored in poor, ramshackle storage sites, exposed to the wind and water of the Arctic region. Some 70 are awaiting full decommissioning; only 20 of these have had their spent fuel removed. Moreover, 40 more over the next several years are expected to need similar treatment: Russian also has 80 operational nuclear submarines and two nuclear-powered cruisers stationed at bases of the Kola (Tikhomirov, p. 68). One report calls them "environmental time bombs."

The urgency felt by Norway for this major hazard in addition to all the other major hazards emanating from the former Soviet Union, is shared by the U.S. Department of Defense and the Department of State. This agreement combined with major cartographic efforts by AMAP, CIESIN, the European Environmental Agency and other alphabet organizations seeks among other goals to map the spread of radioactivity in the area, including the potential hazards to Alaska as well as Scandinavia. Hopefully, the scientific research as well as the applied dismantling of these submarines (and others in another former secret site, Shkotogo-22 in the Far East) will be performed in sufficient time to avoid small Chernobyls, as a leading Russian ecologist called these submarines.

In Russia, the problem of radioactive waste is even more severe. There are radioactive wastes facilities across the country, many of which are already full. There have been underground injections of radioactive waste in at least three places in the FSU: (1) Dmitrovgard on the Volga, (2) Krasnoyarsk on the Yenisey, and (3) Tomsk near the Ob River. A fourth site also reportedly exists. Leakage from these sites would be particularly dangerous to U.S. security and the security of other northern nations, in that the Ob and Yenisey Rivers empty into the Arctic. Can science and technology stop the transmigration of these radionuclides toward the rivers?

The international community is in fact responding to these threats. The Arctic Military and Environmental Cooperation (AMEC) pact of the United States, Norway, and Russia (September 1966), seeks to change the environmental conditions in the Russian Arctic region. Of their six projects, four concern radioactive wastes, including

the joint development of prototype containers for the interim storage of spent nuclear fuel and work on technology for the treatment of liquid and solid radioactive waste. A treatment plant for low-level liquid radioactive waste is already being build in Murmansk under an earlier joint effort by Norway, Russia, and the United States. (EcoNews 1996a).

Finally, and obviously, there is the concern about potential nuclear thefts, terrorism, and associated losses. This issue is particularly difficult because we do not know how much nuclear material may be available: the quantity stored in secret cities and sites is unknown. The security systems in some of these areas are probably problematic. This is but another reminder of the dangers to other countries, not only the domestic society, inherent in an unstable society, with rampant crime and access to nuclear, as well as biological and chemical, weapons of mass destruction.

Infectious diseases. What I call "health security" is also a concern both within the FSU (stress caused by internal migration) and because of potential transmission outside the FSU. The general magnitude of the threat is enormous. The World Health Report 1996: Fighting Disease. Fostering Development, issued by the World Health Organization in 1996, makes it abundantly clear that the renewed as well as the continuing threat of infectious diseases is of the moment. To quote a lead statement in the report:. . . the re-emergence of infectious diseases is a warning that progress achieved so far towards global security in health and prosperity may be wasted unless effective development policies are formulated, and commitments are made to implement them nationally and internationally. (EcoNews, 1996a).

Some background parameters as to the depth of the global problem include the information that malaria is responsible for the death of some 2 million persons per year, acute lower respiratory infections kill almost 4 million children per year, tuberculosis 3 million, diarrhoeal diseases nearly 3 million children per year, 4 million have died of AIDS since acquiring the HIV virus that causes it, viral hepatitis B affects at least 350 million and hepatitis C some 100 million, of whom "at least one quarter of them will die of related liver disease." Further, we find that "some of the 10 million new cases of cancer [of the stomach, cervix and liver] diagnosed in 1995 were caused by viruses bacteria, and parasites" (not an unimportant matter to all of us). Migration and. . . the mass movement of populations, it is also noted in the WHO report, provide "fertile breeding grounds for infectious diseases." With 120 million persons estimated to be residing in a place different from their birth [many of these relocations are forced or unplanned], this can contribute significantly to the potential for infectious diseases already noted. Lastly, the WHO report flatly states that infectious diseases are the world's leading cause of premature death. And premature death is a major concern of the countries of the former Soviet Union—although much if not most still is from exogenous causes, especially heart and cancer, and not infectious diseases. But as we will see, the growth of infectious diseases is astonishingly high in the territories under consideration here, and therefore the threat is potentially global as well as domestic.

The potential for disease to spread as a result of travel to or from the former Soviet area, as well as travel by former residents with latent or actual disease vectors is substantial. The diseases that generate the most concern in terms of potential to spread beyond the borders of the former Soviet Union include diphtheria, tuberculosis, cholera,

and polio. Diphtheria has increased to almost 40,000 new cases in Russia, and another 60,000 in the remainder of the newly independent states (NIS). While there was only a slight decrease in Russia in 1995, large increases were reported in Tadjikistan and Ukraine, among others, in the same year. There have been reports of more than 20 imported cases of diphtheria from the NIS into Europe[3] and Mongolia.[4] It is, therefore, essential that the United States and other countries maintain high levels of diphtheria immunity among both adults and children.

Tuberculosis has officially been reported as 70,000 new cases each year in Russia, but a figure of some 100,000 for this republic alone is more likely if the medical statistics system included the homeless, forced migrants, and refugees who are not captured except for special medical team surveys of persons normally not seen at medical institutions. In addition, rates among prisoners previously went unrecorded until some were recently released; virtually the entire prison population is now suspected to be ill with tuberculosis.

There is a clear and present danger of a potential explosion of AIDS, at least in the Slavic areas. Data here are very poor, and better tracking tends to show much higher rates than originally reported. For example, at the beginning of 1995, only 185 cases of HIV were reported in the Ukraine. Then, we hear that the numbers of HIV cases exploded in two Ukraine oblasts, increasing from single digit figures to over 3000 cases in early 1996. It is now reported that in all of Ukraine, some 8000 cases were recorded by October of 1996 (UPI 1996). These data are reflective not only of better reporting, but of the vast expansion of use of hard drugs transiting through the country or staying around.

Concomitantly, there is a shocking explosion in recent years of syphilis. Infection rates among juvenile females have increased dramatically; for 10–14-year-old girls, for example, the rate increased by 30 times between 1990 and 1994. Males 18 years of age appearing for the draft in the fall of 1996 present 11 times as many cases of syphilis from only three years earlier (Muhkin and Solovyev 1996). Reports indicate major increases in other venereal diseases, all of which can be taken as potential precursors of HIV and then AIDS. Continuing poor hospital conditions—over half of all hospitals in the country in recent years did not have any hot water—as well as a much larger gay population at risk than ever estimated or guessed led to the conclusion that HIV and AIDS undoubtedly will explode in and possibly out of the region.

In Russia, a continued deterioration can be expected as the State Budget recently rejected by the Duma incorporated a minimum of 40% reduction from the already low federal budgetary allocation for health issues. If this reduction is confirmed in the final annual budget adopted by the Duma, it likely will lead to continued deterioration of the health status of the population. The problems with HIV and AIDS are indicative of the state of the health system as a whole. How bad is the health situation in the FSU? Are the frightening reports just a Western bourgeois exaggeration? Perhaps a quote from an early November 1996 interview with Academician Andrey Vorobyev, a member of the Kremlin medical team who provide consultation to Yeltsin on his health, and the director of the Hematological Research Center in Moscow, should more than suffice to make the point:

For the first time in my 40-year long career as a doctor, I have found my-

> self in a position of a man who can be responsible for a patient's death. People with blood system tumors, children suffering from hemophilia, patients awaiting kidney transplants are all doomed to die. We have run out of medicines and blood transfusion systems. For over three months now our center has not received as little as a ruble for buying medicines, meals for patients and paying our electricity bills (Radyuhin 1996).

And this is from the director of a major national, even international, medical center.

If it is so bad in Moscow, what about the rest of the country? In general, it is far from bold to say it is much worse in most, but not all cases. Information on regional distributions of health (as well as environmental) patterns show major differentials, ranging in some instances by orders of magnitude. For example, the range of meningococcal infections throughout the Russian Federation in the period 1990–1991 was less than 1 per 100,000 in one territory and up to 13.0 at the maximum. Pertussis (i.e., whooping cough) ranged from less than 1.5 per 100,000 in some areas, up to 80 per 100,000 in others during the same period. Thus, possible disease proliferation depends both upon the rates in specific region contiguous to territories beyond Russian borders.

One can legitimately wonder, for example, whether recent reports about the spread of polio in the southern tier of Europe—Greece with five cases in September 1996, Yugoslavia with 20 cases reported between August 1 and October 21 of 1996, and Albania with 134 cases (14 deaths) might not reflect the newly revealed explosion of polio in Chechnya. Even partial data reflecting polio in the Chechnya area revealed 137 cases in the nine months between March and November 1995 (in addition to the approximately 150 cases in 1994). Immunization of the Albanian population seems to have reduced the new incidence to low levels during the second week of October of this year. But will it spread further? Finally, the European Union and the World Health Organization took note of the new emergence of polio and have succeeded in providing supplies and carrying out immunization in most of this region.

Secrecy has greatly hindered progress in the attempts to improve public health, in large part by hiding the dimensions of the problem not only from foreign experts, but from Russian decision makers themselves. Dr. David Zaridze of the Cancerogenesis Institute of the Russian Academy of Science speaks to this issue, having experienced it under the Soviet system.

"In the past," he writes in June 1996,

> [W]hen statistics were published on some diseases that were declassified from time to time, they were doctored to avoid incurring the wrath of bosses at all levels, from district Party secretaries all the way to Central Committee secretaries. Practically all studies on the harmful effect of environmental and occupational factors on human health were labeled 'top secret' or 'classified.' After censorship, most scientific publications contained no factual data left, and their scientific and practical value was zero.
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> • • •
>
> For many years, I was an expert for a W[orld] H[ealth] O[rganization] working group set up to evaluate the cancer-inducing effect on human beings of various

factors, and I know for sure that not a single scientific paper published in the Soviet Union before the mid 1980s could provide a reliable basis for concluding whether or not a given substances is liable to induce [cancer]. Soviet specialists were not worse than Western ones, they were simply given no chance to work seriously (Zaridze 1996).

Any expectation that the local and regional authorities will spend the necessary amounts for health (as well as for environmental controls) is optimistic in the extreme. In this light, one is entitled to ask whether environmental degradation and the collapse of the health system could, in fact, lead to social destabilization or even "social disintegration" as feared by UNICEF in a December 1993 publication. If this were to occur, it would have a number of obvious, and serious, security implication for the United States and its allies.

Remote Sensing Initiative. The issue of undue secrecy, or simply lack of information, is being addressed somewhat by agreement reached by Vice President Gore and Chernomyrdin in 1994. This agreement has laid the groundwork for remote sensing systems, which can serve a number of purposes. They include:

- Tracking nuclear material and waste
- Timely tracking of impending ecological disasters
- Determining ecological disaster areas
- Reacting to emergency situations
- Tracking geological processes, such as earthquakes
- Noting land degradation
- Tracking ice movements on rivers
- Tracking forest diseases, pest infestation, pollution impacts on tree covers
- Tacking pollution of surface and underground waters
- Assisting in cartography
- Locating mineral deposits and ensuring that their exploitation and reclamation are environmentally sound

Summary

The FSU offers an unfortunate case study of the pressures on a society that can arise when health and environmental issues are allowed to fester without being mitigated. From disease rates, to bad water, to careless management of nuclear waste—the legacy of the Soviet system is an interlinked disaster waiting to happen. Moreover, as the FSU case makes clear, the impacts of a nation ignoring its environmental health obligations are not contained only within that state's borders: they affect both its neighbors and, in this era of global transportation, far off states as well. Nuclear contamination and disease are not respectors of political boundaries, which is one of the powerful rationales for integrating environmental issues into our foreign policy and security programs.

The FSU example also illustrates several other points. For one thing, it demonstrates that the cost of doing something right the first time is usually much less than

trying to clean up the problem afterwards. The trick, of course, is that in many cases the cost of cleanup, remediation, or mitigation can be passed on to someone else. In fact, the FSU government may be playing a very serious game, assuming that the Western powers will help it clean up its mess simply because they will be significantly, and adversely, affected if they don't do so. The implications of this kind of maneuvering have not been adequately considered by policymakers in the United States, or the West generally, but obviously bear on the question of when an environmental issue in a particular state becomes a matter of environmental security to another state.

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Endnotes

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